



CHEMICAL SCIENCES LABORATORY

Annual Operating Plans and R2X
2015 – 2020

ESRL-CSD FY17 Annual Operating Plan

DOC Strategic Plan Objective (If applicable)	5-Year Research Plan Goal: Objective - Target	NOAA Annual Guidance Memo Priority	NGSP Goal: Objective (If applicable)	OAR Strategic Plan	Performance (NOTE: Do not report Measure or Milestone Targets in the same row)				Measure or Milestone Targets (NOTE: Do not report Measure or Milestone Targets in the same row)																	PRIMARY RESPONSIBILITY			PERFORMANCE MEASURE and MILESTONE DESCRIPTIONS											
					Measure (The monitoring of ongoing progress toward pre-established goals.)	Milestone (A distinct activity planned for completion on a scheduled date)	Select any	Quarterly Cumulative	Actuals							Target	Actual	Target	Actual	Target	Actual	Target	Actual	Why was the target missed?	When will the target be completed?	What is the risk of missing the target?	Target	Target		Target	Target	Targets	Unit within LO/SO	Point of Contact	Responsible SES	NOAA Region (if applicable)				
									SPRA	APR	DOC Strategic Plan	10	11	12	13	14	15	16	17 Q1	17 Q1	17 Q2	17 Q2	17 Q3	17 Q3	17 Q4	17 Q4	18 Q1	18 Q2		18 Q3	18 Q4	19	20	21	22	23				
Please use the pull-down menu to select the objective	Please use the pull-down menu to select the objective	Please use the pull-down menu to select the objective	Please use the pull-down menu to select the objective	Please use the pull-down menu to select the objective					x	n/a	54	123	200	305	436	566	0	0	0	0	0	0	0	0	0	610	703							ESRLCSD	Eric Williams	David W. Fahey		These publications inform the scientific community of CSD research results and advance scientific understanding. They provide the information needed by stakeholders and decision-makers to develop effective policies and adaptation and mitigation strategies		
	Climate: Improve understanding - Assess Natural Variability	Resilience: Advance earth system & ecosystem models (OAR)	Climate_Scientific	Stakeholder: Communicating science	Cumulative number of ESRL-CSD articles published in the peer-reviewed literature.																																			
	Weather: Improved predictive guidance - Improve air quality modeling	Resilience: Advance earth system & ecosystem models (OAR)	Weather_AWQA	Stakeholder: Communicating science	Cumulative number of reports to stakeholders and decision-makers that provide a policy-relevant scientific synthesis of results from intensive field studies, process studies, and analyses.				x	n/a	n/a	1	2	5	6	6	0	0	0	0	0	0	0	0	0	0	7	7						ESRLCSD	Eric Williams	David W. Fahey		CSD reports provide a distillation of key scientific findings on emissions, transport, atmospheric processing, and impacts of climate forcing agents and their precursors, species related to air quality degradation, and compounds important for stratospheric		
	Weather: Improved predictive guidance - Improve air quality modeling	Resilience: Advance earth system & ecosystem models (OAR)	Weather_AWQA	Stakeholder: Communicating science	Provide a policy-relevant scientific synthesis of results from the first phase of the Fire Influence on Regional and Global Environments Experiment (FIREX) program: controlled studies of emissions from selected biofuels																						1	1						ESRLCSD	Eric Williams	David W. Fahey		Delays in data analysis prevented fulfillment of this milestone; it will be evaluated for completion during FY18. To fulfill the requirement CSD will substitute another synthesis document - Atmospheric Impacts of Oil and Gas Development in Texas - which was delivered to the Texas Commission on Environmental Quality during Q3 of FY17		
	Climate: Improve understanding of atmosphere - Evaluate effects of compounds	Resilience: Advance earth system & ecosystem models (OAR)	Climate_Services	Modeling: Improve quantitative prediction	Cumulative number of substances, proposed as replacements for stratospheric ozone depleting industrial compounds (e.g., solvents, refrigerants) whose ozone depleting potential (ODP) and greenhouse-warming potential (GWP) have been evaluated.				x	n/a	n/a	1	2	2	3	4	0	0	0	0	0	0	0	0	0	0	5	5						ESRLCSD	Eric Williams	David W. Fahey		Provides to industry stakeholders critical information on climate impacts of proposed replacement stratospheric ozone depleting chemicals prior to manufacture.		
	Climate: Improve understanding of atmosphere - Evaluate effects of compounds	Resilience: Advance earth system & ecosystem models (OAR)	Climate_Services	Modeling: Improve quantitative prediction	Evaluation of climate-related properties of one chemical compound proposed as a replacement for ozone-depleting substances																						1	1						ESRLCSD	Eric Williams	David W. Fahey		Provides to industry stakeholders critical information on climate impacts of proposed replacement stratospheric ozone depleting chemicals prior to manufacture.		
	Climate: Improve understanding of atmosphere - Quantify emissions	Resilience: Advance earth system & ecosystem models (OAR)	Climate_Scientific	Modeling: Improve quantitative prediction	Cumulative number of emission sources and source regions whose inventories have been evaluated for accuracy via top-down analyses				x	n/a	n/a	New Baseline	1	2	2	3	0	0	0	0	0	0	0	0	0	0	3	3						ESRLCSD	Eric Williams	David W. Fahey		Provides verification of key inputs to climate and air quality models resulting in reduced uncertainty in model outputs, which provides decision-makers greater confidence in establishing policies and emission management strategies.		
	Climate: Obs - Integrate into short and long time scale models	Resilience: Advance earth system & ecosystem models (OAR)	Climate_Scientific	Data: Environmental Data	Cumulative number of intensive field studies planned and executed that provide 1) high quality data sets with defined uncertainties and 2) interpretations and analyses used to advance scientific understanding of atmospheric chemical and physical processes				x	n/a	n/a	n/a	n/a	New baseline	1	1	0	0	0	0	0	0	0	0	0	0	2	2						ESRLCSD	Eric Williams	David W. Fahey		Provides observations, analyses, and interpretations of the current state of atmospheric composition, changes and trends of atmospheric constituents, advanced scientific understanding of atmospheric chemical and physical processes, and improved understand		
	Climate: Improve understanding of atmosphere - Quantify emissions	Resilience: Advance earth system & ecosystem models (OAR)	Weather_AWQA	Data: Environmental Data	Plan and execute the first phase of the Fire Influence on Regional and Global Environments Experiment (FIREX): measure emissions from biofuels in a controlled environment (USFS Fire Lab in Missoula, MT)																													ESRLCSD	Eric Williams	David W. Fahey		Utilize state-of-the-art instruments (gas phase and aerosol) to characterize and quantify the emissions from selected biomass fuels in the western and southeastern U.S. Measurements will be conducted under controlled conditions at the USFS (USDA) Fire Lab		
	Climate: Key impacts - Advance activities focused on impacts of climate	Resilience: Advance earth system & ecosystem models (OAR)	Climate_Scientific	Data: Environmental Data	Participate in an additional activity of the Fire Influence on Regional and Global Environments Experiment (FIREX): conduct field measurements of biomass burning emissions at the high-elevation Storm Peak Laboratory																													ESRLCSD	Eric Williams	David W. Fahey		Utilize state-of-the-art instruments (gas phase and aerosol) to characterize the composition, transport, and transformations of emissions from wildfires in the western U.S. Measurements will be conducted at the high-elevation Storm Peak laboratory near ST		
	Weather: Improved predictive guidance - Improve air quality modeling	Resilience: Advance earth system & ecosystem models (OAR)	Weather_AWQA	Data: Environmental Data	Cumulative number of studies, using field measurements and modeling, that focus on boundary-layer transport, structure, and processes that affect atmospheric composition.				x	n/a	n/a	n/a	n/a	n/a	n/a	1	0	0	0	0	0	0	0	0	0	0	0	1	1						ESRLCSD	Eric Williams	David W. Fahey		Conduct observations, analyses, and interpretations of the structure and dynamics of the atmospheric boundary layer using state-of-the-art instrumentation (Doppler lidar, chemical, e.g., ozone, lidar, etc.). Provide advanced scientific understanding of	
	Engagement: Improve understanding of stakeholders - Create mechanisms to collaborate	Org Excellence: People, teams, and tools (DUS-O)	OA_Workforce	Stakeholder: Communicating science	Number of Postsecondary Students in Higher Education Programs																														ESRLCSD	Eric Williams	David W. Fahey			
	Engagement: Improve understanding of stakeholders - Create mechanisms to collaborate	Org Excellence: People, teams, and tools (DUS-O)	OA_Workforce	Stakeholder: Communicating science	Number of Postsecondary Degrees in Higher Education Programs																															ESRLCSD	Eric Williams	David W. Fahey		A University of Colorado graduate student who conducted her research at CSD received her Ph.D. degree in Q4.

ESRL-CSD FY17 R2X

Identifier (Name of Parent Project)	Brief Description	Statement of intended purpose	Lifecycle Phase Moved from				Lifecycle Phase Moved to				Target	Target	Target	Target	Actual	Why was the target missed? When will the target be completed? What is the risk of missing the target?	Targets					Date Completed Fiscal year and quarter the project will transition to operations / applications	OAR Point of Contact	OAR Responsible SES	OAR Contributing Partners	Customer	A clear statement of what condition must be met for the product advancement to have been made. This should be sufficient to allow a knowledgeable observer to evaluate whether the advancement has been achieved.	Type of RZA (Choose all applicable)			Cost of R2X Transition Funding amount to move the project into operations/ applications (Only the profile shift and NOT the total funding amount.)
			Research	Development	Demonstration	Operations or Applications	Research	Development	Demonstration	Operations or Applications							17 Q1	17 Q2	17 Q3	17 Q4	17 Q4							18	19	20	
SONGNEX	Plan and execute the Shale Oil and Natural Gas NEXus (SONGNEX) mission to study emissions from energy development activities in the U.S.		x												Delays in incorporating CSD research results into next generation national emission inventories have occurred at USEPA. Completion date for this activity is unknown. CSD will reconsider this R2A activity for FY18							FY16/Q4	Eric Williams	David Fahey	ESRL/GSD ESRL/GMD GFDL CIRES/CU OMAO	State/local Acq Mgrs USEPA Industry (possibly)	The transition to Application will be made when the results presented in the scientific synthesis document are incorporated by USEPA into updated inventories of emissions of species related to oil and gas development in various regions of the U.S. This w			X	\$500K (2 FTE)

ESRL-CSD FY2018 R2X

Identifier (Name of Parent Project)	Brief Description	Statement of intended purpose	Lifecycle Phase Moved from				Lifecycle Phase Moved to				Target	Target	Target	Actual	Target	Targets					Weather Act	Date Completed Fiscal year and quarter the project will transition to operations / applications	OAR Point of Contact	OAR Responsible SES	OAR Contributing Partners	Customer	A clear statement of what condition must be met for the product advancement to have been made. This should be sufficient to allow a knowledgeable observer to evaluate whether the advancement has been achieved.	Type of RZA (Choose all applicable)			Cost of RZA Transition	
			Research	Development	Demonstration	Operations or Applications	Research	Development	Demonstration	Operations or Applications	18 Q1	18 Q2	18 Q3	18 Q3	18 Q4	19	20	21	22	23								Operations	Commercial	Other		
UWFPS	Aircraft-based field mission to understand sources of high levels of particulate material in the Salt Lake City, UT, region in wintertime	Provide Utah Dept1 of Air Quality scientific information to remediate a major air quality concern	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	Early April Q3/FY2018	Eric Williams, ESRL/CSD	David Fahey, ESRL/CSD		Utah Department of Environmental Quality; Department of Air Quality	The final report, which is a deliverable in the contract with Utah, will be submitted to Utah DEQ in early April, 2018. Acceptance of this report will transition this research to information.	FALSE	FALSE	TRUE	\$100K (1/2 FTE)
NOy-CARDS	Commercialization of new technology developed by CSD scientists for research purposes. Patent has been issued; commercialization being pursued.	Develop smaller and lighter-weight instrumentation to measure atmospheric trace gases from aircraft.	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	Date unknown at this point, but likely early FY2019.	Eric Williams, ESRL/CSD	David Fahey, ESRL/CSD		Still under evaluations, possibly High Precision Devices in Boulder, CO	A commercial company to license this technology must be found and a CRADA or other vehicle executed to take the technology to commercialization.	FALSE	TRUE	FALSE	\$100K (1/2 FTE)

ESRL-CSD FY19 Annual Operating Plan

Milestone or Measure?		IF Measure, which type?		Performance Measure or Milestone	Mappings	Performance Targets and Actuals																				Primary Responsibility										
Milestone	Measure	Quarterly Cumulative	Cumulative Across Years		Weather Act	Past Actuals								FY-19 Q1		FY-19 Q2		FY-19 Q3		FY-19 Q4				FY-20 Quarterly Targets				Future Annual Targets					Point of Contact	Responsible SES		
						FY-10	FY-11	FY-12	FY-13	FY-14	FY-15	FY-16	FY-17	FY-18	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Why was the target missed? When will the target be completed? What is the risk of missing the target?		FY-20 Q1	FY-20 Q2	FY-20 Q3	FY-20 Q4	FY-21	FY-22	FY-23	FY-24			FY-25	
						TRUE									TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE														
TRUE				Evaluation of climate-related properties of one chemical compound proposed as a replacement for ozone-depleting substances	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	0	0	0	FALSE	1	1	0	FALSE			FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	Eric Williams	David Fahey		
TRUE				Analyze data from the 2017 Fires, Asian, and Stratospheric Transport Las Vegas Ozone Study and prepare a scientific synthesis for the Clark County, Nevada, Department of Air Quality	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	Eric Williams	David Fahey		
TRUE				Fire Influence on Regional and Global Environments Experiment (FIREX-AQ) joint with NASA: use the NASA DC-8 aircraft to measure emissions and investigate chemical processing of emissions during downwind transport of plumes from wildfires in the U.S. (NOTE: this activity was combined with NASA due to NOAA WP-3D aircraft non-availability.)	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE			FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	Eric Williams	David Fahey
TRUE				Use a NOAA Twin Otter aircraft to measure with a newly-developed Doppler lidar instrument the three-dimensional wind fields near biomass burning plumes from wildfires and controlled burns (FireWinds).	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE			FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	Eric Williams	David Fahey
TRUE				Use a NOAA Twin Otter aircraft to measure emissions and investigate chemical processing of emissions during downwind transport of plumes from wildfires (FireChem).	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE			FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	Eric Williams	David Fahey
TRUE				Use an unmanned aerial system (UAS) to measure with newly-developed aerosol instruments the aerosol emissions from biomass burning plumes at night (NightFox).	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	This mission depended on University of Colorado colleagues to provide the UAS, but they could not provide the UAS on time. The payload for the UAS was instead successfully flown on the NOAA Twin Otter aircraft along with the Doppler lidar system (see above milestone).	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	Eric Williams	David Fahey	
	TRUE	TRUE		Annual number of ESRL-CSD articles published in the peer-reviewed literature.	FALSE		54	123	200	305	436	566	New baseline	129	10	33	20	33	30	61	40	89			10	10	10	10	40	40	40	40	40	Eric Williams	David Fahey	
	TRUE	TRUE		Annual completion rate (percent) of stakeholder supported scientific research activities (i.e., MOAs, MOUs, etc.) that require laboratory studies, field studies, modeling and analyses to provide actionable scientific information needed by stakeholders.	TRUE			1	2	5	6	6	New baseline	100	0	0	100	100	0	0	0	0			-	-	-	100	100	100	100	100	100	Eric Williams	David Fahey	
	TRUE		TRUE	Cumulative number of controlled laboratory studies that evaluate industrial compounds (e.g., solvents; refrigerants) for adverse effects on stratospheric ozone and global warming prior to large-scale manufacture.	FALSE			1	2	2	3	4	5	6	0	0	0	0	7	7	0	0			-	-	-	8	8	9	9	10	10	Eric Williams	David Fahey	
	TRUE		TRUE	Cumulative number of field studies planned and executed that provide 1) high quality data sets with defined uncertainties and 2) interpretations and analyses used to advance scientific understanding of chemical, physical, and dynamical processes that influence atmospheric composition.	TRUE					New Baseline	1	1	2	4	0	0	0	0	0	0	8	8			-	-	-	8	9	9	10	10	11	Eric Williams	David Fahey	
	TRUE	FALSE	FALSE	R2A Index	FALSE									0	0	1	1	1		0	0												Eric Williams	David Fahey		

ESRL-CSD FY19 R2X

Identifier (Name of Parent Project)	Brief Description	Statement of Intended Purpose	Lifecycle Phase Moving from		Lifecycle Phase Moving to				FY-19 Targets & Actuals												Future FY Targets					Weather Act	Date Completed Fiscal year and quarter the project will transition to operations / applications	OAR Point of Contact	OAR Responsible SES	OAR Contributing Partners	Customer	A clear statement of what condition must be met for the product advancement to have been made. This should be sufficient to allow a knowledgeable observer to evaluate whether the advancement has been achieved.	Type of R2X			Cost of R2X Transition										
			Research	Development	Demonstration	Operations or Applications	Research	Development	Demonstration	Operations or Applications	FY-19 Q1		FY-19 Q2		FY-19 Q3		FY-19 Q4		20	21	22	23	24	Operations	Commercial								Other	Funding amount to move the project into operations/ applications (Only the profile shift and NOT the total funding amount.)												
							Target	Actual	Why was the target missed? When will the target be completed? What is the risk of missing the target?	Target	Actual	Why was the target missed? When will the target be completed? What is the risk of missing the target?	Target	Actual	Why was the target missed? When will the target be completed? What is the risk of missing the target?	Target	Actual	Why was the target missed? When will the target be completed? What is the risk of missing the target?																												
NOy-CARDS	Commercialization of new technology developed by CSD scientists for research purposes. Patent has been issued; commercialization being pursued with collaboration of TPO	Develop smaller and lightweight instrument to measure atmospheric trace gases from aircraft platforms	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE		FALSE	FALSE		FALSE	FALSE		FALSE	FALSE		FALSE	FALSE		TRUE	Delayed	Release for sale of NOy-CARDS instrument by HPD has been delayed due to engineering problems; release date TBD	FALSE	FALSE		TRUE	TRUE	TRUE	TRUE	TRUE	FALSE		Eric Williams	David Fahey	TPO	High-Precision Devices, Boulder, CO	Customer determines market for instrument; builds and sells instruments	FALSE	TRUE	FALSE	\$20K
FAST-LVOS	Field mission using TOPAZ lidar to understand sources of ozone around Las Vegas, NV	MOU Deliverable: Provide atmospheric composition and boundary layer transport data to Clark County, NV, to meet national air quality standard for ozone	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE		TRUE	TRUE	Final report submitted to Clark County. Additional analyses requested and new agreement under negotiation. Expected completion will be Q1/FY20	FALSE	FALSE		FALSE	FALSE		TRUE	TRUE	TRUE	TRUE	TRUE	TRUE				TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE	TRUE	\$100K							

CSL FY20 Annual Operating Plan - Performance Measures

Performance Measure	Description	Mapping					Past Year Actuals		Current Year Reporting								Future Annual Targets					Point of Contact			
		DOC SP	NOAA AOP	APPR	CJ	OAR Strategic Goal	FY-18		FY-19		FY-20 Q1		FY-20 Q2		FY-20 Q3		FY-20 Q4		FY-21	FY-22	FY-23		FY-24	FY-25	
							Target	Actual	Target	Actual	Target	Actual	Target	Actual	Why was the target missed? When will the target be completed? What is the risk of missing the target?										
Annual number of NOAA peer reviewed publications related to environmental understanding and prediction	The annual number of peer reviewed publications is an indicator of productivity and relevance and is tracked using on-line resources. Peer review is one of the important procedures used to ensure that the quality of published information meets the standards of the scientific and technical community.	TRUE	TRUE	TRUE	TRUE	Drive Innovative Science	129				10	37	10	32	10	39	10	33		40	40	40	40	40	Eric Williams
R2A Index: Annual number of OAR R&D products transitioned to a new stage(s) (development, demonstration, or application).	The measure captures the count of significant and discrete OAR research and development products that have transitioned to development, demonstration, or an application. Products include transitions occurring within OAR and applying group(s) outside of OAR. This includes research, development, and demonstration performed and supported by OAR as well as utilization of OAR R&D products by external parties	TRUE	TRUE	TRUE	TRUE	Drive Innovative Science					0	0	0	0	0	0	2	2							Eric Williams
Annual completion rate (percent) of stakeholder supported scientific research activities (i.e., MOAs, MOUs, etc.) that require laboratory studies, field studies, modeling and analyses to provide actionable scientific information needed by stakeholders.	CSL works with stakeholders (e.g., state air quality districts) to execute agreements wherein stakeholders provide funding for CSD to plan and execute research activities with the goal of delivering to stakeholders reports that provide a distillation of key scientific findings on emissions, transport, atmospheric processing, and impacts of 1) climate forcing agents and their precursors, 2) species and processes related to air quality degradation, 3) and compounds important for stratospheric ozone loss. Stakeholders do not have the resources to obtain the scientific information that NOAA can provide. This information is key for management of atmospheric environmental issues such as poor air quality, as well as for regulatory compliance.	FALSE	FALSE	FALSE	FALSE	Detect Changes in the Ocean and Atmosphere	100										100	100		100	100	100	100	100	Eric Williams
Cumulative number of controlled laboratory studies that evaluate industrial compounds (e.g., solvents; refrigerants) for adverse effects on stratospheric ozone and global warming prior to large-scale manufacture.	Provides to industry stakeholders critical information on environmental impacts of proposed industrial chemicals prior to manufacture.	FALSE	FALSE	FALSE	FALSE	Drive Innovative Science	6								8	8				9	10	10	10	10	Eric Williams
Cumulative number of field studies planned and executed that provide 1) high quality data sets with defined uncertainties and 2) interpretations and analyses used to advance scientific understanding of chemical, physical, and dynamical processes that influence atmospheric composition.	Provides observations, analyses, and interpretations of the current state of atmospheric composition, changes and trends of atmospheric constituents, advanced scientific understanding of atmospheric chemical and physical processes, and improved parameterizations in numerical models. Provides verification of key inputs (e.g., chemical reaction rate coefficients, emissions of pollutants and precursors, etc.) to climate and air quality models resulting in reduced uncertainty in model outputs, which provides decision-makers greater confidence in establishing policies and emission management strategies.	FALSE	FALSE	FALSE	FALSE	Detect Changes in the Ocean and Atmosphere	4								9	9				10	11	11	12	12	Eric Williams

CSL FY20 Annual Operating Plan - Milestones

Milestone	What performance measure does this contribute to, if any?	Mapping				Current Year Reporting								Point of Contact		
		OAR Strategic Goals	NOAA level AOP	O&M action	Lab / Program Review action	FY-20 Q1		FY-20 Q2		FY-20 Q3		FY-20 Q4				
						Target	Actual	Target	Actual	Target	Actual	Target	Actual		Why was the target missed? When will the target be completed? What is the risk of missing the target?	
Fire Influence on Regional and Global Environments Experiment (FIREX-AQ) joint with NASA: use the NASA DC-8 aircraft to measure emissions and investigate chemical processing of emissions during downwind transport of plumes from wildfires in the U.S. (NOTE: this activity was combined with NASA due to NOAA WP-3D aircraft non-availability.)	Cumulative number of field studies planned and executed that provide 1) high quality data sets with defined uncertainties and 2) interpretations and analyses used to advance scientific understanding of chemical, physical, and dynamical processes that influence atmospheric composition.	Detect Changes in the Ocean and Atmosphere	FALSE	FALSE	FALSE	1	CANCELED								This target was met on schedule. The last flights of the mission were scrubbed due to aircraft issues. However, all previous mission flights were completed and high quality observations collected. Data analyses and modeling are now underway.	Eric Williams
Evaluation of climate-related properties of one chemical compound proposed as a replacement for ozone-depleting substances	Cumulative number of controlled laboratory studies that evaluate industrial compounds (e.g., solvents; refrigerants) for adverse effects on stratospheric ozone and global warming prior to large-scale manufacture.	Drive Innovative Science	FALSE	FALSE	FALSE					1	1					Eric Williams
Portable Optical Partide Spectrometer Network (POPS-Net) is a long-term field study to provide detailed aerosol measurements at high spatial and time resolution. The data will be used in conjunction with DOE and Leeds University (UK) modelers to evaluate and improve model representation of atmospheric aerosols at sub-grid scales.	Cumulative number of field studies planned and executed that provide 1) high quality data sets with defined uncertainties and 2) interpretations and analyses used to advance scientific understanding of chemical, physical, and dynamical processes that influence atmospheric composition.	Make Forecasts Better	FALSE	FALSE	FALSE	1	1									Eric Williams
The Atlantic Tradewind Ocean-Atmosphere Mesoscale Interaction Campaign (ATOMIC) is a field study to investigate atmospheric shallow convection and air-sea interaction in the tropical North Atlantic east of Barbados. CSL scientists will focus on cloud microphysical measurements to improve parameterization of these critical cloud processes in models.	Cumulative number of field studies planned and executed that provide 1) high quality data sets with defined uncertainties and 2) interpretations and analyses used to advance scientific understanding of chemical, physical, and dynamical processes that influence atmospheric composition.	Explore the Marine Environment	FALSE	FALSE	FALSE					1	1					Eric Williams
As part of the UCAR CPAESS Visiting Scientist Program, CSL scientist (Dr. Amy Butler) will continue collaboration with NCEP CPC to create operational GFS and CFSv2 forecasts of the stratosphere.	Annual completion rate (percent) of stakeholder supported scientific research activities (i.e., MOAs, MOUs, etc.) that require laboratory studies, field studies, modeling and analyses to provide actionable scientific information needed by stakeholders.	Make Forecasts Better	FALSE	FALSE	FALSE							1	1	Target was met and research is ongoing. However, further research activities required a modified agreement due to change of Dr. Butler from CIRES to Federal employment.	Eric Williams	
CSL is working with GSL, ARL, and NCEP/EMC to implement and evaluate aerosol chemistry in the FV3-based Global Forecasting System (GFS). CSL evaluates the FV3GFS-Aerosols model using aircraft observations collected during the Atmospheric Tomography Mission (ATom). FV3GFS-Aerosols, whose code was frozen in August 2019 and delivered to EMC for operational implementation, will become the newest member of NOAA's Global Ensemble Forecasting System in FY20.	R2A Index: Annual number of OAR R&D products transitioned to a new stage(s) (development, demonstration, or application).	Make Forecasts Better	FALSE	FALSE	FALSE							1	1		Eric Williams	
CSL is working with GSL, NESDIS, and Science and Technology Corporation to improve retrievals from instruments onboard the NOAA/NASA Joint Polar Satellite System's spacecraft, including Suomi-NPP and NOAA-20. CSL uses observations from aircraft field missions, such as ATom and FIREX-AQ, to evaluate the vertical profiles and horizontal distributions of trace gases measured by the CrIS infrared sounder and aerosol optical depths measured by the VIIRS visible-infrared radiometer. CSL's evaluations are leading to improvements in the CrIS and VIIRS retrieval algorithms that will ultimately transition to the operational products from NESDIS/STAR.	R2A Index: Annual number of OAR R&D products transitioned to a new stage(s) (development, demonstration, or application).	Detect Changes in the Ocean and Atmosphere	FALSE	FALSE	FALSE							1	1		Eric Williams	
CSL has recently initiated a comprehensive program at the DSRC in Boulder, CO, to examine changes in atmospheric composition related to decreased economic activity as a result of the COVID19 crisis. COVID-AQS is a research activity aimed at assessing changes in emissions and their effects on air quality and climate. This is an ongoing study taking advantage of significantly reduced emissions from vehicle traffic and other man-made sources to investigate changing chemical and physical processes in the atmosphere. CSL will continue these measurements to assess atmospheric changes as economic activity resumes and man-made emissions return to pre-COVID19 levels.	Cumulative number of field studies planned and executed that provide 1) high quality data sets with defined uncertainties and 2) interpretations and analyses used to advance scientific understanding of chemical, physical, and dynamical processes that influence atmospheric composition.	Detect Changes in the Ocean and Atmosphere	FALSE	FALSE	FALSE							1	1		Eric Williams	

